ABSTRACT.

An adaptive interface for a programmable system, for predicting a desired user function, based on user history, as well as machine internal status and context. The apparatus receives an input from the user and other data. A predicted input is presented for confirmation by the user, and the predictive mechanism is updated based on this feedback. Also provided is a pattern recognition system for a multimedia device, wherein a user input is matched to a video stream on a conceptual basis, allowing inexact programming of a multimedia device. The system analyzes a data stream for correspondence with a data pattern for processing and storage. The data stream is subjected to adaptive pattern recognition to extract features of interest to provide a highly compressed representation that may be efficiently processed to determine correspondence. Applications of the interface and system include a video cassette recorder (VCR), medical device, vehicle control system, audio device, environmental control system, securities trading terminal, and smart house. The system optionally includes an actuator for effecting the environment of operation, allowing closed-loop feedback operation and automated learning.